

ALIGNING AN OPTICAL DEVICE SYSTEM WITH AN OPTICAL LENS SYSTEM

ABSTRACT

5 A scheme (systems and methods) for passively aligning one or more
optical devices with a corresponding number of optical lenses in an accurate and
efficient manner is described. By this approach, the invention avoids the often
labor-intensive and costly steps required by conventional active alignment
techniques that attempt to align the optical devices to the optical fibers. In one
aspect, an optoelectronic device includes an optical device system, an optical lens
10 system and a plurality of solder bumps disposed therebetween. The optical
device system includes an optical device substrate supporting one or more optical
devices and a solderable metallization pattern having a spatial arrangement with
respect to the one or more optical devices. The optical lens system includes one
or more optical lenses and a device bonding surface supporting a solderable
15 metallization pattern having a spatial arrangement with respect to the one or
more optical lenses. The solder bumps are disposed between the metallization
patterns of the optical device system and the optical lens system. The plurality of
solder bumps bond the optical device substrate to the device bonding surface with
the one or more optical devices aligned with the one or more optical lenses. In
20 another aspect, the optical lens system includes a spacer substrate defining one or
more apertures therethrough. A method of aligning an optical device system and
an optical lens system also is described.